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GSGN98133-DIV2

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Patent no.: 7,231,096  
Appl'n no.: 10/695,118  
Filed: October 28, 2003  
For: **SCREENING METHOD FOR OVERLAPPING SUB-IMAGES**

Issued:: June 12, 2007  
Inventor:: Broddin et al.

**CERTIFICATE OF MAILING**

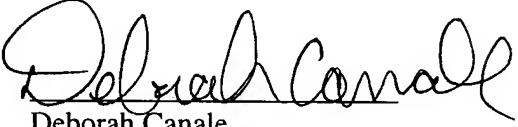
Commissioner for Patents  
Attn: Certificate of Corrections Branch  
P.O. Box 1450  
Alexandria, VA. 22313-1450

January 7, 2008

Dear Sir or Madam:

I hereby certify that this paper, a two page Letter, a one page Certificate of Correction, five pages of copies of papers previously filed with the Office and a postcard are being deposited on January 7, 2008 with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Certificate of Corrections Branch, Commissioner for Patents, P.O. Box 1450, Alexandria, VA. 22313-1450.

Respectfully,

  
Deborah Canale

Agfa Corporation  
Law & Patent Department  
200 Ballardvale Street  
Wilmington, MA. 01887-1069

RAS/pc

**Certificate**  
JAN 11 2008  
**of Correction**

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Patent no.: 7,231,096

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Letter

Commissioner for Patents  
Attn: Certificate of Corrections Branch  
P.O. Box 1450  
Alexandria, VA. 22313-1450

January 7, 2008

Dear Sir or Madam:

Attached to this Letter is a Certificate of Correction, a Certificate of Mailing, copies of papers previously filed with the Office, and a postcard.

On October 23, 2003 this application, also referred to as attorney docket no. XP-0801-DIV, was filed as a Divisional application (see attached one page Transmittal Letter, Form PTO/SB/05) of parent application no. 09/427,810 filed on Oct. 27, 1999 and issued on Feb. 10, 2004 as US 6,690,837. Item no. 18 of the attached PTO transmittal form provides the US priority data and instructions to *"supply the requisite information below in the first sentence of the specification following the title..."*. Also attached is a copy of the 2 page Declaration and Power of Attorney that was filed with the parent application in 1999. A copy was supplied with the Divisional application papers filed on Oct. 23, 2003. The Declaration includes additional foreign and domestic priority data.

Also attached for your convenience are the front pages of this Divisional patent no. 7,231,096 and the parent patent no. 6,690,837.

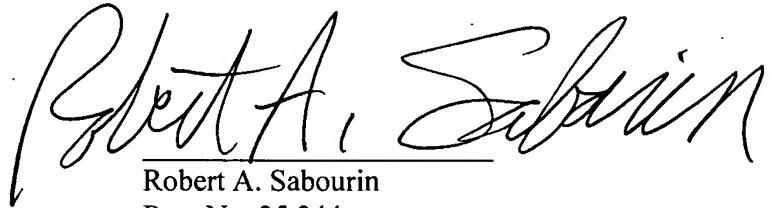
Since (1) a request was made on the Form PTO/SB/05 to include the US priority information for the co-pending parent application no. 09/427,810, and since (2) the EP and provisional priority information was included on the Declaration, it is respectfully

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that all of the requirements have been met by the Applicants to have the related application and priority data corrected for the front page of the 7,231,096 patent without any fees due. If necessary, please charge any fees due under this general authorization to Assignee Deposit Account no. 13-3377 and make the necessary corrections as requested.

Respectfully submitted,

A handwritten signature in cursive script, reading "Robert A. Sabourin". The signature is written in dark ink and is positioned above a horizontal line.

Robert A. Sabourin  
Reg. No. 35,344

RAS/pc

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**UNITED STATES PATENT AND TRADEMARK OFFICE  
CERTIFICATE OF CORRECTION**

Page 1 of 1

PATENT NO. : 7,231,096  
APPLICATION NO.: 10/695118  
ISSUE DATE : June 12, 2007  
INVENTOR(S) : Broddin et al.

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Please add to the front page of the patent.

--  
Related U.S. Application Data

This application is a divisional of US patent application no 09/427,810 filed on October 27, 1999 and issued as US patent no. 6,690,837 on February 10, 2004 which in turn claims priority to Provisional application no. 60/112,310 filed on December 14, 1998.

Foreign Application Priority Data

EP98203869 filed on November 3, 1998.  
--

MAILING ADDRESS OF SENDER (Please do not use customer number below):

Robert A. Sabourin, AGfa Corporation, Patent Law Department  
200 Ballardvale Street, Wilmington, MA 01887

This collection of information is required by 37 CFR 1.322, 1.323, and 1.324. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1.0 hour to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Attention Certificate of Corrections Branch, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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Approved for use through 07/31/2006. OMB 0651-0032  
U.S. Patent and Trademark Office, U.S. DEPARTMENT OF COMMERCE

<b>UTILITY PATENT APPLICATION TRANSMITTAL</b>  (Only for new nonprovisional applications under 37 CFR 1.53(b))	Attorney Docket No.	XP-0801-DIV
	First Inventor	Dirk Broddin
	Title	Screening Method for Over...
	Express Mail Label No.	ER304169393US

<b>APPLICATION ELEMENTS</b> See MPEP chapter 600 concerning utility patent application contents.	<b>ADDRESS TO:</b> Mail Stop Patent Application Commissioner for Patents P.O. Box 1450 Alexandria VA 22313-1450
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1. ☒ Fee Transmittal Form (e.g., PTO/SB/17)  
(Submit an original and a duplicate for fee processing)
2. ☐ Applicant claims small entity status.  
See 37 CFR 1.27.
3. ☒ Specification [Total Pages 37]  
(preferred arrangement set forth below)
  - Descriptive title of the invention
  - Cross Reference to Related Applications
  - Statement regarding Fed sponsored R & D
  - Reference to sequence listing, a table, or a computer program listing appendix
  - Background of the Invention
  - Brief Summary of the Invention
  - Brief Description of the Drawings (if filed)
  - Detailed Description
  - Claim(s)
  - Abstract of the Disclosure
4. ☒ Drawing(s) (35 U.S.C. 113) [Total Sheets 7]
5. Oath or Declaration [Total Sheets 2]
  - a. ☐ Newly executed (original or copy)
  - b. ☒ Copy from a prior application (37 CFR 1.63(d))  
(for continuation/divisional with Box 18 completed)
    - i. ☐ **DELETION OF INVENTOR(S)**  
Signed statement attached deleting inventor(s) name in the prior application, see 37 CFR 1.63(d)(2) and 1.33(b).
6. ☐ Application Data Sheet. See 37 CFR 1.76

7. ☐ CD-ROM or CD-R in duplicate, large table or Computer Program (Appendix)
8. Nucleotide and/or Amino Acid Sequence Submission (if applicable, all necessary)
  - a. ☐ Computer Readable Form (CRF)
  - b. Specification Sequence Listing on:
    - i. ☐ CD-ROM or CD-R (2 copies); or
    - ii. ☐ Paper
  - c. ☐ Statements verifying identity of above copies

**ACCOMPANYING APPLICATION PARTS**

9. ☒ Assignment Papers (cover sheet & document(s))
10. ☐ 37 CFR 3.73(b) Statement of Power of Attorney (when there is an assignee)
11. ☐ English Translation Document (if applicable)
12. ☒ Information Disclosure Statement (IDS)/PTO-1449 ☒ Copies of IDS Citations
13. ☒ Preliminary Amendment
14. ☒ Return Receipt Postcard (MPEP 503) (Should be specifically itemized)
15. ☐ Certified Copy of Priority Document(s) (if foreign priority is claimed)
16. ☐ Nonpublication Request under 35 U.S.C. 122 (b)(2)(B)(i). Applicant must attach form PTO/SB/35 or its equivalent.
17. ☒ Other: .....

Express Mail Certificate

18. If a CONTINUING APPLICATION, check appropriate box, and supply the requisite information below and in the first sentence of the specification following the title, or in an Application Data Sheet under 37 CFR 1.76:

☐ Continuation ☒ Divisional ☐ Continuation-in-part (CIP) ☐ Prior application No. 09/427,810

Prior application information: Examiner Brian Q. Le Art Unit: 2623  
For CONTINUATION OF DIVISIONAL APPS only; The entire disclosure of the prior application, from which an oath or declaration is supplied under Box 5b, is considered a part of the disclosure of the accompanying continuation or divisional application and is hereby incorporated by reference. The incorporation can only be relied upon when a portion has been inadvertently omitted from the submitted application parts.

**19. CORRESPONDENCE ADDRESS**

☒ Customer Number: 021013 OR ☐ Correspondence address below

Name			
Address			
City	State	Zip Code	
Country	Telephone	Fax	

Name (Print/Type)	<u>Robert A. Sabourin</u>	Registration No. (Attorney/Agent)	<u>35,344</u>
Signature	<u>Robert A. Sabourin</u>	Date	<u>Oct. 28, 2003</u>

This collection of information is required by 37 CFR 1.53(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Mail Stop Patent Application, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.  
If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

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XP-0800-01V

DECLARATION and POWER OF ATTORNEY

**RECEIVED**

As a below-named inventor, I hereby declare that :

My residence, post office address and citizenship are as stated below next to my name,

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled : Screening method for overlapping sub-images, the specification of which

[x] is attached hereto.

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims,

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, §1.56,

I hereby claim foreign priority benefits under Title 35, United States Code, §119(a) -(d) of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

Prior Foreign Application(s) of which Priority is to be claimed :

Application Number : EP 98203869.7      Multilateral Treaty: European Patent Convention

filing date: November 3, 1998      designated state: i.a. Germany

receiving office: European Patent Office  
The Hague/Netherlands

I hereby claim the benefit under Title 35, United States Code, §119(e) of any United States provisional application(s) listed below.

60/112,310      filed December 14, 1998      pending

I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith :

Edward L. Kelley, Reg. No. 41,112  
Robert A. Sabourin, Reg. No. 35,344

SEND CORRESPONDENCE TO

Edward L. Kelley  
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Boudjot  
XP-0800-01V

DECLARATION AND POWER OF ATTORNEY

I hereby declare that all statements made herein of my knowledge are true and that all statements made on information and belief are believed to be true ; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

-----  
Full name of sole or first inventor Dirk Broddin  
Inventor's signature *Dirk Broddin* Date: August 23, 1999  
Residence: Edegem, Belgium Citizenship: Belgian  
Post Office address: c/o Agfa-Gevaert N.V., DIE 3800, Septestraat 27, B 2640 Mortsel, Belgium

-----  
Full name of second joint inventor Mario Verbruggen  
Inventor's signature *Mario Verbruggen* Date: August 23, 1999  
Residence: Baal, Belgium Citizenship: Belgian  
Post Office address: c/o Agfa-Gevaert N.V., DIE 3800, Septestraat 27, B 2640 Mortsel, Belgium

-----  
Full name of third joint inventor Serge Tavernier  
Inventor's signature *Serge Tavernier* Date: August 23, 1999  
Residence: Lint, Belgium Citizenship: Belgian  
Post Office address: c/o Agfa-Gevaert N.V., DIE 3800, Septestraat 27, B 2640 Mortsel, Belgium  
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US006690837B1

(12) **United States Patent**  
**Broddin et al.**

(10) Patent No.: **US 6,690,837 B1**  
 (45) Date of Patent: **Feb. 10, 2004**

(54) **SCREENING METHOD FOR OVERLAPPING SUB-IMAGES**

(75) Inventors: **Dirk Broddin**, Edegem (BE); **Marlo Verbruggen**, Baal (BE); **Serge Tavernier**, Lint (BE)

(73) Assignees: **AGFA-Gevaert**, Mortsel (BE); **Xeikon NV**, Mortsel (BE)

(\*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **09/427,810**

(22) Filed: **Oct. 27, 1999**

#### Related U.S. Application Data

(60) Provisional application No. 60/112,310, filed on Dec. 14, 1998.

#### (30) Foreign Application Priority Data

Nov. 3, 1998 (EP) ..... 98203869

(51) Int. Cl.<sup>7</sup> ..... **G06K 9/40; G06K 9/36**

(52) U.S. Cl. .... **382/254; 382/266; 382/267; 382/284**

(58) Field of Search ..... **382/199, 254, 382/266, 267, 268, 284, 162; 358/1.9-3.32, 540, 465; 356/402**

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EP	0642258	3/1995
EP	0675417	10/1995
EP	0677383	10/1995
EP	0680195	11/1995
EP	0682438	11/1995
EP	0709802	5/1996
EP	0748109	12/1996

\* cited by examiner

Primary Examiner—Amelia M. Au

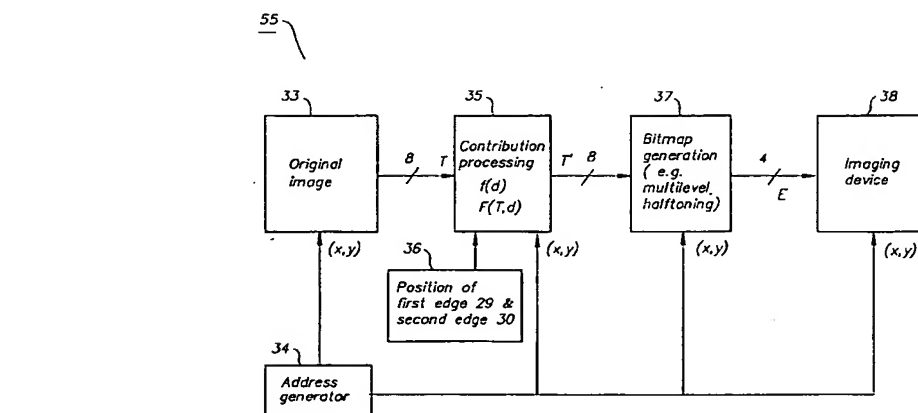
Assistant Examiner—Brian Le

(74) Attorney, Agent, or Firm—John A. Merecki; Robert A. Saboutin

#### (57) ABSTRACT

For the reproduction of originals, images are generated on an image carrier, for example by printing. The imaging device that generates the image is usually not capable to cover at once the complete image area on the carrier. If the device is capable to cover the full width of the image area, the image may be generated line by line. Devices not having this capability will generate a first portion of an image line on the carrier. An adjacent second portion of the image line is then generated by another imaging device or after a period of time by the imaging device that generated the first portion. The region where the first and second portion meet on the carrier may cause visual artefacts on the final reproduction due to spatial misregistration of the adjacent line portions. This problem is solved by dividing the image in adjacent sub-images having an overlap zone on the carrier. Within this overlap zone two sub-images will be generated on top of each other for reproducing the original image in that zone, thereby reducing or avoiding the artefacts. According to one method, the resulting optical density of the first and second sub-image is reduced within the overlap zone as the outer edge of the sub-image in the overlap zone is approached. The density reduction may be achieved by reduction of the microscopic density of individual microdots or by reduction of the dot percentage or by a combination of these techniques.

3 Claims, 7 Drawing Sheets



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US007231096B2

(12) **United States Patent**  
**Broddin et al.**

(10) Patent No.: **US 7,231,096 B2**  
 (45) Date of Patent: **\*Jun. 12, 2007**

(54) **SCREENING METHOD FOR OVERLAPPING SUB-IMAGES**

6,690,837 B1 \* 2/2004 Broddin et al. .... 382/254

**FOREIGN PATENT DOCUMENTS**

- (75) Inventors: Dirk Broddin, Edegem (BE); Mario Verbruggen, Baal (BE); Serge Tavernier, Lint (BE)
- (73) Assignee: Agfa-Gevaert N.V., Mortsel (BE)
- (\*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 493 days.
- This patent is subject to a terminal disclaimer.

EP	0517543	12/1992
EP	0522980	1/1993
EP	0529535	3/1993
EP	0619188	10/1994
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EP	0682438	11/1995
EP	0709802	5/1996
EP	0748109	12/1996

\* cited by examiner

Primary Examiner—Matthew C. Bella

Assistant Examiner—Brian Le

(74) Attorney, Agent, or Firm—Robert A. Sabourin

(21) Appl. No.: **10/695,118**

(22) Filed: **Oct. 28, 2003**

(65) **Prior Publication Data**

US 2004/0085587 A1 May 6, 2004

- (51) Int. Cl.  
 G06K 9/40 (2006.01)  
 G06K 9/36 (2006.01)
- (52) U.S. Cl. .... 382/254; 382/266; 382/267; 382/284
- (58) Field of Classification Search ..... 382/162, 382/189, 254, 266, 267, 268, 284; 358/1.9–3.32, 358/540, 456, 450; 347/3, 212, 188, 196  
 See application file for complete search history.

(56) **References Cited**

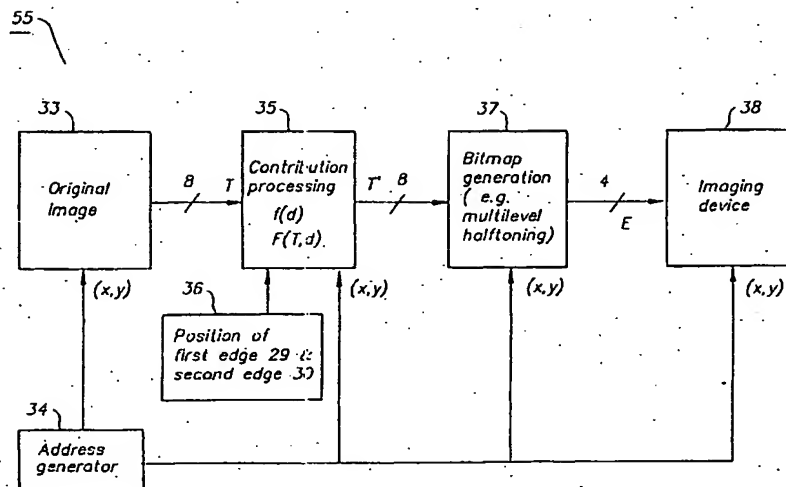
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 6,215,914 B1 \* 4/2001 Nakamura et al. .... 382/284

(57) **ABSTRACT**

A method and system for reproducing an image on a carrier, the method includes: generating a conjoined first and second sub-image, each representative for a portion of the image; defining an overlap region where both sub-images give a contribution to the internal optical density of the carrier; dividing the overlap region in a partition of microdots; establishing for each sub-image a peripheral edge in the overlap region; increasing the contribution by the first sub-image from the peripheral edge of the first sub-image to the peripheral edge of the second sub-image; and assigning to at least one microdot an intermediate microscopic density different from a minimum or maximum microscopic density of microdots; wherein the contribution increases the microscopic density of the microdots by density steps smaller than half the difference between the minimum and maximum microscopic densities of the microdots.

**2 Claims, 7 Drawing Sheets**



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